



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,475	01/17/2002	Yuchun Wang	042496/0269274 NT-238(U)	2723

7590 12/12/2002

PILLSBURY WINTHROP LLP  
1600 Tysons Boulevard  
McLean, VA 22102

EXAMINER

THOMAS, DAVID B

ART UNIT	PAPER NUMBER
----------	--------------

3723

DATE MAILED: 12/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/052,475

Applicant(s)

WANG ET AL.

Examiner

David B. Thomas

Art Unit

3723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 April 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-10, 12-16, 19, 20, 25, 26 and 30 is/are rejected.
- 7) ☒ Claim(s) 4-6, 11, 17, 18, 21-24, 27-29 and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Priority*

1. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows: The statute requires that the applications claiming benefit of the earlier filing date under 35 U.S.C. 119(e) or 120 be filed by an inventor or inventors named in the previously filed application or provisional application.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1, 14, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Birang et al. (6,244,935).

Birang et al. ('935) discloses a CMP apparatus for polishing a surface of a workpiece and for detecting endpoint, comprising: an aperture or hole 154 is formed in platen 100 and is aligned with transparent strip 118 in polishing sheet 110. The aperture 154 and transparent strip 118 are positioned such that they have a "view" of substrate 10 during a portion of the platen's rotation, regardless of the translational

Art Unit: 3723

position of the polishing head. An optical monitoring system 90 is located below and secured to platen 100, e.g., between rectangular platen 100 and platen base 170 so that it rotates with the platen. The optical monitoring system includes a light source 94 and a detector 96. The light source generates a light beam 92 which propagates through aperture 154 and transparent strip 118 to impinge upon the exposed surface of substrate 10. In operation, CMP apparatus 20 uses optical monitoring system 90 to determine the thickness of a layer on the substrate to determine the amount of material removed from the surface of the substrate, or to determine when the surface has become planarized. The computer 280 may be connected to light source 94 and detector 96. Electrical couplings between the computer and the optical monitoring system may be formed through rotary coupling 208. The computer may be programmed to activate the light source when the substrate overlies the window, to store measurements from the detector, to display the measurements on an output device 98, and to detect the polishing endpoint, as described in U.S. Pat. No. 5,893,796 entitled METHOD OF FORMING A TRANSPARENT WINDOW IN A POLISHING PAD FOR A CHEMICAL MECHANICAL POLISHING APPARATUS, filed Aug. 16, 1996 by Manush Birang et al., assigned to the assignee of the present invention, the entire disclosure of which is incorporated herein by reference (Col. 9, lines 22-52).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3723

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 3, 8-10, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birang et al. (6,244,935), as applied to claims 1, 14, and 15 above, in view of Jairath et al. (6,146,248).

Birang et al. (6,244,935) discloses the claimed invention except for the provision of a composite structure, a cavity in the support plate, wherein the optical detection system is mounted within the cavity, and a transparent window covers the cavity. Jairath et al. (6,146,248) discloses a linear polishing belt for use in chemical-mechanical polishing (CMP) of a substrate comprises an opening and a flexible monitoring window secured to the belt to close the opening and to create a monitoring channel in the belt. A plurality of monitoring channels can also be used. A film thickness monitor comprising an interferometer can be disposed alongside the belt or at least partially within a region bound by it. The monitoring channel and the film thickness monitor can

Art Unit: 3723

be used in the CMP process to determine the end point of the CMP process, determine removal rate at any given circumference of a substrate, determine average removal rate across a substrate surface, determine removal rate variation across a substrate surface, and optimize removal rate and uniformity (see abstract). Jairath et al. ('248) teaches as an alternative to placing openings in the belt, each layer of the belt can be partially or completely made of a material substantially transparent to light within a selected range of optical wavelengths, such as about 200 nm to about 2000 nm, eliminating the need to provide a monitoring window in the belt. For example, the fabric may be woven with Kevlar or some other material so as to provide openings in the fabric, or may be constructed with optically clear fiber. Clear polyurethane (or some other clear material) is then molded onto the fabric in a manner described above. This results in a belt assembly that is appropriate for film thickness measurements (Col. 9, lines 44-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the endpointing apparatus of Birang et al. ('935) by providing a composite transparent belt, a cavity in the support plate, an optical detection system in the cavity, and the appropriate light beam range, as clearly suggested by Jairath et al. ('248).

7. Claims 7, 13, 19, 20, 25, 26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birang et al. ('935), as applied to claims 2, 3, 8-10, 12 and 16 above, in view of Travis et al. (6,261,959).

Birang et al. ('935) is discussed above and discloses the claimed invention except for moving the polishing belt bi-directionally. Travis et al. ('959) discloses an

Art Unit: 3723

apparatus for chemically mechanically polishing a semiconductor wafer. Travis et al. ('959) teaches a method of polishing semiconductor wafers by reciprocating the receiving surface and wafer-polishing member in a linear, bi-directional motion against the semiconductor wafer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the polishing unit of Birang et al. ('935) by reciprocating the receiving surface and wafer-polishing member in a linear, bi-directional motion against the semiconductor wafer, as taught by Travis et al. ('959).

***Allowable Subject Matter***

8. Claims 4-6, 11, 17, 18, 21-24, 27-29 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Aiyer, White, and Xu et al. each address polishing substrates where the polishing medium has an optically transparent portion. Landry-Coltrain et al. discloses a coating having abrasive particles that are present in the lubricious overcoat layer, in the transparent magnetic layer or in both the overcoat and the transparent magnetic layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Thomas whose telephone number is (703) 308-4250. The examiner can normally be reached on 8:00-6:30 M-TH.

Art Unit: 3723

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J. Hail can be reached on (703) 308-2687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1148.

dbt  
December 10, 2002



Joseph J. Hail, III  
Supervisory Patent Examiner  
Technology Center 3700